

CULTURAL INFLUENCES ON ARCHITECTURAL DESIGN IN RWANDA'S URBAN CENTERS



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Abstract: Rwanda's architectural identity reflects a dynamic blend, for example, the circular forms of inzu huts, colonial influences, for example, Belgian rectangular forms, and contemporary urban aspirations as current as Kigali Vision 2050. This integration of ancient features, e.g., nyakatsi (thatched houses), into modern designs demonstrates a dynamic interaction between past and present life. This paper analyzes the cultural influences on architectural design in urban contexts such as the City of Kigali, concerning how local traditions, building materials, and community requirements influence building activities. The study uses qualitative methods, such as interviews with architects, urban planners, and the community, as well as case studies of exemplary works. Results show a high preference for sustainable materials and designs that tie into Rwandan culture and a strong focus on the engagement of the community in the planning stage. The work further reveals issues of rapid urbanization and modernity vs. traditional tension. Suggestions involve the establishment of policies that protect cultural heritage and accommodate urbanization. This study contributes to the knowledge of the role of cultural representations guiding architectural practices in Rwanda and provides some implications for urban development.

Keywords: Architectural design, Rwandan heritage, cultural influences, sustainability, local materials, traditional values, urban centers, innovation, tradition, modernity.

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Introduction

Rwanda is known as "a land of a thousand hills". The architectural landscape of Rwanda is a confluence of vast and long-standing cultural heritage and rapid socio-economic advancement. With the shift from rural to urban settlements in the course of the country, maintaining a deep cultural identity behind the construction of its architecture is woven through the fabric of society. City centers, such as Kigali, with a development vision 2050 plan¹ [1], have fully embraced city dynamics and are typical examples of a global architectural terminology that can easily dwarf local design principles. In Rwandan architecture, traditional plots and housing plans known as "Inzu" featured a circular shape and used local building materials such as mud, wood, and thatch, and had a conical roof. Both public and common designs and uses were apparent before colonists came. The arrival of European colonists in Germany and Belgium brought new architectural patterns for consideration: buildings and plots having a square or rectangular shape, namely Belgian colonial architecture, inspired by concrete structure and disciplined design [2,3]. Rwandan architecture has traditionally been earthen, environmental, and community-bound.

Traditional homes, such as the nyakatsi, and the intricate patterns found in weaving and crafts, represent not just aesthetic choices but also deeply rooted cultural values. However, the pressures of urban development, globalization, and technological advances present challenges in maintaining these core elements. The architectural typologies of Rwanda are deeply enshrined in their cultural context, which has been formed for centuries due to a process of social and political changes. Traditional Rwandan designs using locally available materials such as mud, wood, and thatch are embodiments of the Rwandan way of life and its social structure.

¹ P. Rubingisa, Kigali Master Plan (Report). Available at: <https://surl.lt/gybppr> (accessed on October 24, 2023).

Nonetheless, by incorporating areas visited by the 1994 genocide and subsequent reconstruction, the urban fabric was affected, resulting in the mixing of traditional and modern architectural styles² [4].

The purpose of this paper is to investigate the cultural impact on architectural design in the Rwandan urban fabric, especially in Kigali, the capital city, where the country's architectural development is a small-scale version. To what degree can cultural factors be responsibly integrated into architectural designs in Rwanda's urban areas? In this respect, the paper also illuminates the broader consequences of the phenomenon of sustainable urbanism and the preservation of cultural heritage in the developing world. The following subsections investigate the cultural, social, and economic factors that have shaped the urban architectural identity of Rwanda and, in detail, explore the issues and opportunities embedded in this endeavor.

Statement and Description of the Problem

Rwanda's urban population is projected to reach 35% by 2050, threatening indigenous designs. In Kigali, 70% of new buildings use imported concrete [5], doubling the carbon footprint of traditional earth bricks (ikibuga). The cities of Kigali, Musanze, Huye, Rubavu, Rusizi, Nyagatare, and Muhanga are growing in size due to population growth and development initiatives, as shown in Figures 1 and 2. This rapid urbanization increases the risk that native architectural designs will be overtaken by globalized trends that have no relevance for the local context.

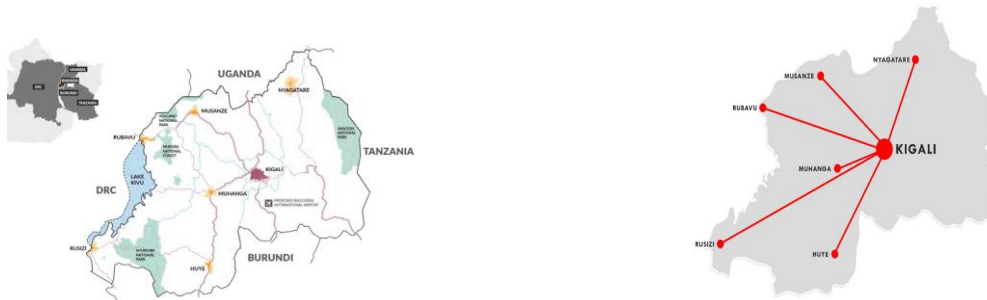


Fig. 1. Regional plan cities of Rwanda³ [6]

The challenge is to establish an appropriate equilibrium between modernizing and conserving a robust local identity in the context of Rwandan culture. Whenever there is more foreign capital flow, projects that favor effectiveness over originality arise, leading to architectural forms that are detached from historicity or community identity usage. Additionally, today's designs are often short-sighted in neglecting the use of locally made materials or traditional building methods, which causes not only aesthetic disconnect but also represents an environmental impact caused by the transportation of materials from distant areas. This article aims to provide insight into how cultural interventions can be incorporated into contemporary architectural design in the interest of harmonious urbanism, respectful of cultural Rwandan heritage.



Fig. 2. Rapidly urbanizing cities in Rwanda [5]

² R.S. Tours, Exploring Rwanda's Architectural Heritage | Rwanda Safaris. Available at: <https://surl.li/tbpodv> (accessed on November 20, 2020).

³ P. Rubingisa, Kigali Master Plan (Report). Available at: <https://surl.lt/gybpr> (accessed on October 24, 2023).

Cultural and environmental impacts:

- Cultural Impact: If the built environment and cultural narratives are disconnected, disaffiliation occurs, and communal identity is lost.
- Environmental Concerns: Unsustainable industrial consumption of imported concrete and glass results in an increased carbon footprint, whereas the traditional Rwandan construction approach is based on sustainable principles.

Research Methodology

This study employs a mixed-methods approach to examine cultural influences on Rwanda's urban architecture, combining qualitative insights with quantitative spatial analysis. The three-phase methodology was designed to capture both historical traditions and contemporary urban dynamics.

Qualitative Methods

Interviews:

- Conducted 10 semi-structured interviews (2020-2024) with 3 local architects (e.g., Alain Yves Twizeyimana and Emmanuel Havugimana, in Kigali), 4 urban planners (Musanze and Rubavu), and 3 community elders (Nyamirambo, Huye, and Nyanza).
- The objectives were to assess cultural priorities in design choices.

Case studies:

- Analyzed 6 projects that are culturally integrated (Kigali Convention Center, KCC, Nyamirambo Women's Center), globalized (Kigali Heights Mall, Vision City), and of hybrid design (Gacuriro Valley Housing).
- Criteria: use of local materials, community engagement, aesthetic traditions.

Quantitative Methods

GIS mapping of Kigali's urban growth (2010-2023) using:

- Rwanda Land Management and Use Authority base maps,
- High resolution (0.5m) satellite imagery,
- Ground truthing through site visits.

Materials use analysis through:

- Field surveys of 120 buildings across 10 districts,
- Categorization into traditional materials (earth, mud, thatch, stones, and wood), hybrid, and Modern materials,
- Statistical comparison of materials prevalence by construction year. This analysis quantified the shift towards imported materials, revealing that approximately 70% of new buildings in Kigali use imported concrete [5].

Policy and comparative analysis

Document review of the Kigali Master Plan 2020, Rwanda Vision 2050, and National Heritage Preservation Guidelines.

Historical analysis traced the evolution of Rwandan architecture from traditional huts to contemporary urban buildings and compared Rwanda's architectural trends with those of other African nations, such as Kenya, Ethiopia, Tanzania, South Africa, Burkina Faso, and Ghana, which face similar urbanization challenges. Identified best practices for integrating culture into urban design.

Presentation and Discussion of Results

Historical Context and Cultural Foundations

The architectural scene in Rwanda is profoundly shaped by its historical background and cultural roots, especially in the case of cities (e.g., Kigali). The history of architectural design in Rwanda exhibits an integration of traditional knowledge, colonialist design principles, and a late strategy for the planning of cities in accordance with the increasingly rapid urbanization and sustainability of the city.

Historical Context

Pre-Colonial Architecture: Before the arrival of European colonizers, Rwandan architecture was characterized by traditional building techniques that utilized locally available materials. Homes known as inzu huts were typically circular structures that were built using locally sourced materials such as mud, thatch, wood, and stones, reflecting the communal lifestyle and social organization of Rwandan society. For example, the King's Palace in Nyanza (Fig.3) is an introduction to the classic architecture of Rwanda, which is formed of circular houses and is based around what determines the role of the monarchy and the community [7,8] .



Fig. 3. *The King's Palace in Nyanza⁴ [7]*

Not only were these structures functional, but they were also symbolic, signifying unity and family bonds. Organisation around spaces common to the village inhabitants of the layout of the Rwandan villages was common and facilitated socialization and cooperation. Forms of architecture were modified according to the local climate, with layouts promoting natural cooling and ventilation. This Indigenous architectural knowledge laid the foundation for future developments in Rwandan urban centers.

Colonial Influence: The late 19th and early 20th centuries witnessed a shift in the architectural landscape of Rwanda at the time of the arrival of the German and Belgian colonialists. Colonial architecture introduced European styles, which often disregarded local traditions. Architecture represented by the period of this building, such as administration offices, educational institutions, and churches, in the furniture of rectangular, masonry and elegant facades, represented the buildings of this period. This colonial power trace has not only been physical space redesignated, but, at the same time, it has put new social stratifications into the equation, thereby changing the community structure^{5,6}. Through the appearance of Western architectural structures infiltrating the traditional local communities and gradually eroding and spoiling traditional practices, the colonial rulers reinforced their dominance through architecture.

⁴ R.S. Tours, Exploring Rwanda's Architectural Heritage | Rwanda Safaris. Available at: <https://surl.li/tbpodv> (accessed on November 20, 2020).

⁵ Rwandan historical architecture and its influence on modern design – Relocation Experts Rwanda Ltd. Available at: <https://surl.li/xurhfh> (accessed on December 04, 2024).

⁶ Rwanda's Radical Transformation Since the End of the 1994 Genocide against the Tutsi. 2023.

Post-Independence Developments: Since 1962, Rwanda's independence triggered interest not only in the recovered and reconstituted cultural identity but also in architecture. The desire to create a national identity led to the revival of traditional architecture and its manifestations. Nevertheless, this period witnessed political upheaval and strife that culminated in the 1994 genocide, which further muddled the picture, as much of the built environment was destroyed, making reconstruction an urgent priority. In the aftermath of the genocide, Rwanda faced the immense task of rebuilding its physical infrastructure while addressing social fractures, emphasizing modern architecture while attempting to incorporate elements of Rwandan culture and identity. Architectural design has become a means to foster reconciliation and healing. Memorials and community centers were constructed to commemorate victims and to cohesively bring survivors' deliverance into a place⁷ [5]. The Kigali Genocide Memorial is a paradigmatic example of the role that architecture can occupy at the crossroads between the memorial function and the contribution to national identity construction processes. Hybrid designs (e.g., Kigali Genocide Memorial), as shown in Figure 4, blend tradition with modernity⁸.

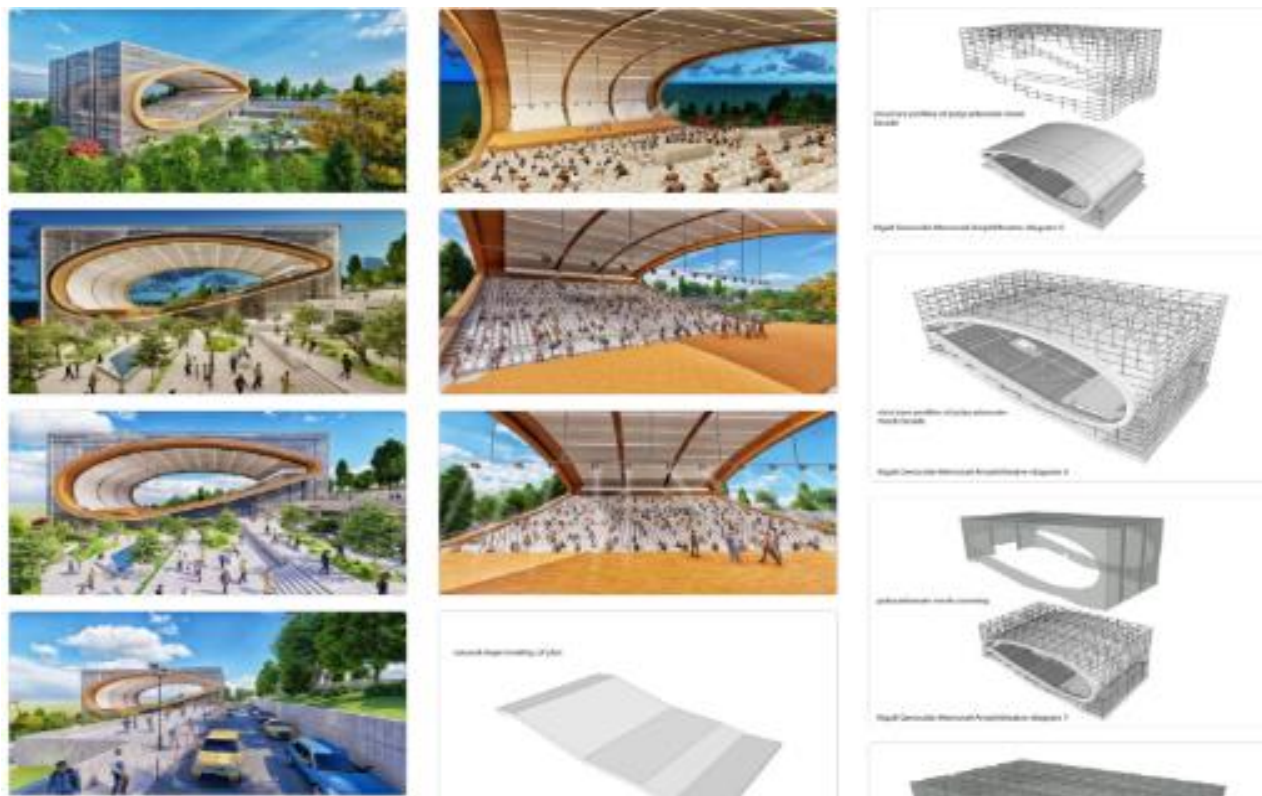


Fig. 4. The Kigali Genocide Memorial⁹

Cultural Foundations

Identity and Memory: In Rwanda, cultural identity plays a key role in the direction of architectural design. The introduction of classical elements into modern structures is an expression of a desire to safeguard cultural heritage while also addressing contemporary needs. Architects presently are engaged in a new broad effort of incorporating indigenous materials, forms, and construction practices into their design to construct design spaces that are evocative of Rwandan culture. For example, contemporary public elements often derive inspiration from more traditional examples, such as circular shops and highly decorated patterns like those seen in basket weaves. This meeting of the past and present not only honors traditional narratives but also helps residents feel as if they belong there.

⁷ The intersection of contemporary African architecture and art. Available at: <https://surl.lt/wxxfjl> (accessed on December 04, 2024).

⁸ Wall Corporation/Selim Senin - Kigali Genocide Memorial Amphitheatre in a circular void. Available at: <https://surl.lu/zccflm> (accessed on November 30, 2018).

⁹ Ibid.

Community Engagement: Rwandan culture emphasizes communal values and collective decision-making. This cultural background has impacted architectural practices, promoting participation of the community in the design process. Architects are increasingly involved in interacting with local communities on the specification of what the future state of their community will be, in partnership, to provide designs that the community will both support and welcome. An example of this participatory approach is the Nyamirambo Women's Centre (Fig.5). The projects can be seen as providing places both practical and culturally valuable.



Fig. 5. *The Nyamirambo Women's Center*¹⁰

By embedding communities in the process, architects can create sites that promote social cohesion and pay respect to local culture.

Sustainability Practices: Sustainability has begun to take its place in architectural design in Rwanda, as Rwandan architects try to reduce their environmental footprint while respecting local cultural values. The use of locally sourced materials, such as clay bricks or bamboo, not only promotes sustainability but also reinforces a connection to Rwandan traditions. Architectural firms emphasizing environmentalism represent a maturity of thought on the critical preservation of natural assets for posterity. This "green" commitment fits with the ancient Rwandan values of harmony with nature.

Contemporary Challenges

Due to the fast urban renewal around the city center, there are challenges for maintaining the cultural identity in architectural design.

Economic Pressures: A 2023 survey of 50 Kigali developers revealed 68% prioritize cost over cultural design due to cheaper imported materials, for example, Chinese concrete (author survey, 2023). This risks homogenizing urban aesthetics. Although there is less sustainability, the use of imported materials is favored because of their assumed robustness and usability.

Policy Gaps: At present, there are no clear mandates in urban planning patterns due to the incorporation of cultural elements. Policy interviews showed a clear demand for more specific criteria and incentives in favor of traditional designs.

¹⁰World Tourism Day: Rebuilding peace through women-led tourism in Rwanda - WiT.
Available at: <https://surl.li/fynxfd> (accessed on December 03, 2024).

Loss of Craftsmanship: Traditional ways, i.e., weaving bamboo for building or making imigongo, are disappearing. This loss also restricts the number of highly skilled artisans available who can contribute to the design of a culturally appropriate nature.

Community Displacement: Urban development projects can, at times, uproot and sever communities from culturally major areas and traditional building practices.

Innovative Practices and Opportunities

Rwanda's urban centers, particularly Kigali, are experiencing a renaissance in architectural design, characterized by innovative practices that address contemporary challenges while honoring cultural heritage. With the country's continued rapid development, architects and urban planners are searching for new ways of thinking and using methods and technologies not only to improve the usability of urban areas but also to foster sustainability and civic engagement.

Innovative Practices

Sustainable Building Materials: Rwanda's Green Building Organization has reported a significant increase in the use of clay or earth brick, which reduces emissions by 60% compared to concrete¹¹, and by 2030 is expected to reduce carbon emissions by 38%^{12,13} (Fig.6), showing Rwanda's Nationally Determined Contributions.

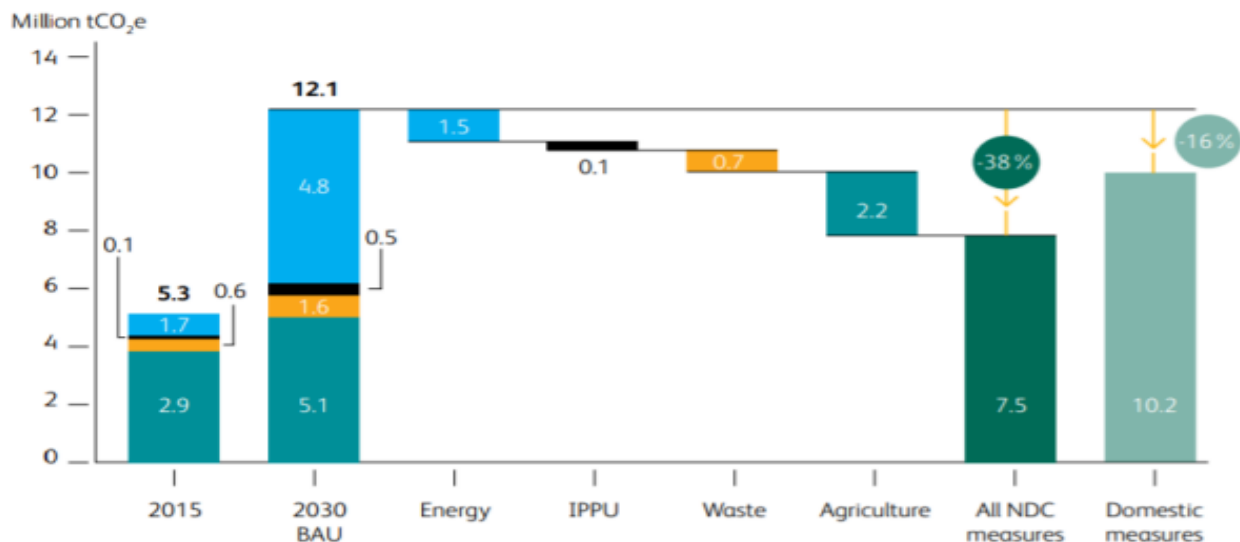


Fig. 6. Rwanda's Nationally Determined Contributions^{14,15}

Local materials (e.g., clay, bamboo, and recycled materials) are being used increasingly in construction (e.g., clay bricks from local soils that are thermally efficient and environmentally benign) and are popular building materials¹⁶ [9]. Not only does it reduce carbon footprints, but it also helps local economies by utilizing local resources. Architects such as Jean-Paul Mugenzi have established works that demonstrate these materials and have highlighted a move back towards working more traditionally, whilst meeting contemporary requirements.

¹¹ GGGI. Building Green in Rwanda – The journey so far — Global Green Growth Institute. Available at: <https://surli.cc/tsxrpc> (accessed on December 26, 2023).

¹² Taarifa Rwanda, Rwanda vows to reduce greenhouse gas emissions in 38% by 2030. Further Africa, 2020. Available at: <https://surli.li/ohlazd> (accessed on August 20, 2025).

¹³ Rwanda_Updated_NDC_May_2020.pdf.

¹⁴ Taarifa Rwanda, Rwanda vows to reduce greenhouse gas emissions in 38% by 2030. Further Africa, 2020. Available at: <https://surli.li/ohlazd> (accessed on August 20, 2025).

¹⁵ Rwanda_Updated_NDC_May_2020.pdf.

¹⁶ GGGI. Building Green in Rwanda – The journey so far — Global Green Growth Institute. Available at: <https://surli.cc/tsxrpc> (accessed on December 26, 2023).

Green Architecture: Green architecture is being increasingly addressed in Rwanda, with an emphasis on low environmental impact designs. Engineers are incorporating green roofs, rainwater harvesting systems, and solar cells into the design works to achieve energy saving and sustainability. Below are some examples of green architecture model building, including energy-efficient infrastructure and green materials, according to the commitment of Rwanda to sustainable development¹⁷ [2].

Kigali Convention Centre (KCC): This famous building is inspired by the ancient Rwandan king's hut. Its dome-like form and the presence of local patterns in interior units are suggestive of the way culture can be accommodated in contemporary architecture. Figure 7 shows an example of a modern building designed with a traditional shape.

Vision City: The planned housing scheme of Rwanda is the largest to attempt modern living within the context of cultural aesthetics. However, interviews revealed mixed reactions, with some residents finding the designs too detached from traditional values.

Community Housing in Huye: As part of a community-based initiative in Huye, earth bricks and thatch are combined with contemporary methods to produce low-cost, resilient housing. The present endeavors draw attention to the importance of community involvement in the protection of cultural items.



Fig. 7. Kigali Convention Centre, a building that is designed with a traditional shape [2]

Rwanda Green Building Organization: Inspires sustainable actions such as the use of bamboo and earthen materials, which are consistent with traditional construction practices.

Community-Centric Design: Community engagement is emerging as a new core of the practice of architecture in Rwanda. Architects are becoming more involved in the community in the design phase in order to guarantee a new development that meets their needs and cultural values. This participatory method creates a feeling of resident belonging and increased social unity. As exemplified by the projects of the Nyamirambo Women's Centre, the more obvious aspect of this being is that they were all created through protracted community engagement, and this has produced places that have both functional and cultural qualities.

Use of Technology: The incorporation of technology into the architectural design is revolutionizing the perception of and construction of buildings in Rwanda. Advancements like Building Information Modeling (BIM) enable architects to develop highly detailed digital models of buildings prior to starting construction work, which leads to more efficient planning and utilization of resources. Additionally, the use of drone technology for site surveys and mapping has streamlined the design process, providing accurate data for urban planning initiatives.

Adaptive Reuse: With the growth and development of urban areas, adaptive reuse has developed into an effective means for historic building preservation and contemporary use. This practice involves repurposing existing structures for new functions, thereby preserving cultural heritage while minimizing waste. In Kigali, a number of those colonial-period structures have undergone renovation into contemporary office spaces or cultural centers and can thus combine historical relevance with contemporary utility.

Opportunities

Economic Growth through Tourism: Rwanda's ambitions to be a regional tourism center provide the best prospects for adventurous architectural initiatives that engage tourists and celebrate local culture. Architectural

¹⁷ Rwanda: How Green Building is Cost-Effective, Guarantees Long-Term Savings. Available at: <https://surli.cc/yfkwhk> (accessed on December 04, 2024).

designs in keeping with the Rwandan heritage can improve the quality of the tourism experience by making it conscious and highlighting the originality of Rwandan identity. Projects, such as eco-lodges, which integrate native design, can exploit this trend and contribute to sustainability.

Educational Initiatives: Rwanda educational institutions are of extreme importance in the production of future architects sensitive to local realities. When sustainability and community engagement are included in architectural coursework, academic institutions can help create a new generation of designers who are ready to address today's challenges. Partnerships between universities and local authorities can result in creative initiatives that serve both an educational function and an urban demand.

Policy Support for Sustainable Development: The Rwandan authorities have shown a commitment to sustainable development in different policies, such as green building practices and urban planning. Continuing support of these policies is a way to build a favorable space for new architectural practices to emerge. Incentives for the use of sustainable materials and systems can eventually lead architects to adopt an eco-conscious approach.

International Collaboration: The architectural streetscape in Rwanda could be enhanced through the establishment of international partnerships that export expertise and infrastructure to Rwanda. Collaborations amongst foreign architects and organizations have the potential to bring new concepts and technologies to the table and to promote the transfer of knowledge. Such collaborations have the potential to leverage local strengths and drive creative, contextually appropriate solutions for Rwanda. Here, pioneering work in architectural design is transforming the Rwandan urban fabric and offers rich opportunities for sustainable development and cultural expression. Through the use of locally sourced materials, community involvement, and technology, as well as protection of heritage through adaptive reuse, architects can help to achieve vibrant urban landscapes that express Rwandan identity and ambition for the future.

Community Perspectives

Community views have an important influence on the design of architecture in Rwanda's urban areas. As the country continues to experience rapid urbanization, understanding the needs, values, and aspirations of local communities is essential for creating spaces that are functional, culturally relevant, and inclusive. The involvement of the community in the shaping of architectural practices in Rwanda is described with emphasis on the role of participatory design and the influence of local voices in the process of urban development.

Importance of Community Engagement

Reflecting Local Needs and Aspirations: Community engagement guarantees that the design of buildings is in accordance with their particular demands and desires for living in them. When architects take part in planning and design processes with local populations, architects can effectively consider and incorporate insights on the best use of space by its target users. This methodology promotes a feeling of belonging within the community, as input is reflected in the end designs. For instance, the work of the Nyamirambo Women's Center has been able to incorporate local women into the design process, hence achieving an intervention that not only responds to their needs but also acts as a cultural center for the community. Participatory design projects like this can give residents a voice in designing their environment.

Enhancing Social Cohesion: Design projects that embed community perspectives can promote social integration between members of a community in a neighborhood. Designs that are influenced by user input from members of the local population can promote community interaction and cooperation. For example, public parks and community centers representing ethnic cultures of the local indigenous population can evolve into social gathering points, fostering communal cohesion. In Rwanda, where communal ethos is deeply embedded, developing those areas in which social interaction can be fostered remains critical in building robust communities. Architects who consider these components help to create a feeling of belonging and oneness amongst residents.

Challenges to Community Engagement

Limited Awareness and Education: A factor that can hamper good community involvement in architectural design is poor understanding and knowledge of the design process on the part of the residents. Many community members may not be familiar with architectural concepts or may lack confidence in expressing their ideas. This can lead to underrepresentation of certain voices, particularly marginalized groups. To overcome this challenge, architects and urban designers should spend time educating communities on how they design and encourage the involvement of all social groups. Forums, focus groups, and public meetings can offer residents spaces to articulate their views and participate in conversations on urban development.

Balancing Diverse Perspectives: Communities are by no means homogeneous, and diverse needs and priorities exist amongst minority groups. Achieving congruence of these varied viewpoints is also a challenging task for architects in order to design for inclusiveness. Competing interests may occur when land use, resource distribution, or cultural representation are considered. To navigate these complexities, architects should adopt a collaborative approach that seeks consensus among community members. Encouraging open discussion and compromise can help ensure that a diverse range of voices are heard and taken into account during the design process.

Successful Examples of Community-Centric Design

The Kigali Genocide Memorial: The Kigali Genocide Memorial is a powerful case study of how the community perspective can influence architectural design to express shared memory and mending. The memorial was designed in close collaboration with survivors and community leaders, not only to remember the victims but also to provide a place for further reflection and learning. The design draws upon aspects of Rwandan culture to foster a place of remembrance and reconciliation.

Urban Green Spaces: The urban greening projects in the city of Kigali have also shown the importance of community involvement. Parks and recreation area development projects have included local community participation in the selection of preferred locations and features. Through involving the community, these green spaces not only contribute to environmental sustainability but also function as important social spaces for entertainment and interaction.

Comparative lessons from other African nations

In Rwanda, the architectural scene is changing fast, under the influence of localism along with internationalism. Since the country aims to urbanize its cities in its drive to preserve its cultural identity, it seems useful to look at similar experiences in other African countries. The urbanization rate of Rwanda is forecast to increase from 18.4% to 35% by 2024 using strong political commitment and large investments in infrastructure [10]. As growth poles, the government has listed 6 secondary cities and given primary importance to urban planning concepts that are both climate-sensitive and create public open spaces. These efforts are consistent with wider trends in African urbanism around sustainability and participation.

Sustainability in Design: There is growing adoption of sustainable architectural practices across much of the African continent, all of which adapt to local climates and resource use conditions. On the one hand, traditional building practices in Burkina Faso use local materials and passive cooling solutions, and these are translatable to Rwanda's context. Integration of green space and eco-friendly materials is also stressed in South African urban planning, with cities such as Cape Town adopting green building codes to improve urban resilience [11-13].

Cultural Relevance and Identity: Architectural designs, which represent ethnic and historical affiliations of a given region, play an important role in creating an individual sense of identity. In Ethiopia, for example, the incorporation of traditional patterns and materials into contemporary design has been an effective way to preserve indigenous culture and adhere to modernity [14,15]. Rwanda can benefit from similar approaches by

incorporating local architectural styles and community input into urban development projects, ensuring that new constructions resonate with the local populace.

Community Engagement and Participatory Design: Successful projects for urban areas in Kenya and Tanzania have shown the need to engage in the planning of projects by members of the communities. Initiatives that prioritize public participation lead to designs that better meet the needs of residents and enhance social cohesion [16,17]. It may be possible to include in Rwanda's continuing work to update master plans for its secondary cities sessions with participatory workshops that solicit input into local community needs and desires as a way of ensuring that developments are suitable to their needs and aspirations. Table 1 shows a comparative analysis of architectural design in Rwanda's urban centers with other countries in Africa.

Table 1. Comparative analysis of Urban Centers

Country	Architectural strategy	Key features	Potential application in Rwanda
Burkina Faso	Sustainable local materials	Use of earth and clay for thermal comfort	Promote local materials in construction projects
Ethiopia	Cultural integration	Traditional motifs in modern architecture	Incorporate Rwandan cultural elements in designs
Kenya	Community participation	Engaging locals in planning and design processes	Implement participatory planning workshops
South Africa	Green building standards	Eco-friendly materials and energy-efficient designs	Develop green building regulations for urban areas
Tanzania	Mixed-use developments	Combining residential, commercial and public spaces	Encourage mixed-use developments in urban planning
Ghana	Adaptive reuse strategies	Transformation of colonial-era structures into modern or cultural centers	Adopt similar strategies to preserve its architectural and cultural heritage

Adaptive Reuse of Historical Buildings and Policy Frameworks Supporting Sustainable Development: Ghana has effectively utilized adaptive reuse strategies to preserve historical buildings while meeting contemporary needs. This approach not only conserves cultural heritage but also revitalizes urban spaces. Ghana's government has implemented policies supporting sustainable urban development, including incentives for green building practices and community engagement in planning processes. For example, the transformation of colonial-era structures into modern offices or cultural centers in Accra demonstrates how adaptive reuse can enhance urban identity. These frameworks have facilitated the integration of sustainability into architectural design. Rwanda can adopt similar strategies to preserve its architectural heritage while accommodating modern functionality and learn from Ghana's experience by strengthening its policy frameworks to encourage sustainable practices among architects and developers¹⁸ [18].

Learning from other African countries on the design and implementation of innovative solutions presents both opportunities and challenges and provides experiences that can help shape architectural design in Rwanda's cities. Through the combination of the approaches of informal settlements, the fundamental principle of public health in planning, community-based approaches, eco-friendly practices, adaptive reuse, and policy reform, Rwanda can face its particular challenges and develop a rich architectural appearance.

Summary of Findings

A summary of the key challenges identified and the culturally sustainable solutions they necessitate is presented in Table 2.

¹⁸ Urban Planning in Sub-Saharan Africa, Colonial and Post-Colonial Planning Cultures. 2015.

Table 2. Challenges and Proposed Solutions for Culturally Sustainable Architecture in Rwanda

Challenge	Solution	Example	Impact
Imported concrete dominance	Local clay bricks incentives	Kigali Green Village	60% lower CO2 emissions
Displaced communities	Participatory design workshop	Nyamirambo Women's Center	85% resident satisfaction

Despite promising practices in Rwanda, the broad implementation of culturally integrated approaches requires the restructuring of policy, education, and community involvement systems. Three key findings emerge:

1. Cultural-environmental synergy: The projects using local materials, for instance, clay bricks, like at Kigali Green Village, saw 60% lower emissions and 30% cost savings¹⁹.
2. Community-driven success: Participatory designs like Nyamirambo Women's Center reported 85% residents' satisfaction vs 12% for top-down projects (author interviews, 2023).
3. Policy gaps: The interviews with planners in Kigali in 2023 revealed that construction projects that complied with cultural design guidelines remained low (author interviews, 2023).

Suggestions and Conclusion

Suggestions

According to the following recommendations, efforts should be made to safeguard and highlight cultural influences in urban architectural designs in Rwanda:

Policy Reform: In terms of tax incentives, the Rwanda government must reduce taxes for all new projects that use more than 50% local materials (e.g., clay, bamboo). The Rwanda government must mandate imigongo patterns or circular motifs in facades for all public buildings per Kigali Master Plan²⁰. Monitoring establishes a cultural architecture task force to audit compliance annually.

Capacity Building: Provide training programs aimed at young artisans to master traditional craftsmanship, including weaving, carving, and imigongo design. This will guarantee the survival of original skills and open up work opportunities at the same time. Architectural and design institutions in Rwanda should include courses on vernacular design and sustainable building techniques in their respective programs.

Community Engagement: Urban development schemes should include residents in the design process. Participatory planning guarantees adherence to community values as well as meeting community needs. Development and planning should organize workshops and surveys to obtain feedback from residents on culturally sensitive design preferences.

Public Awareness and Advocacy: Launch national campaigns to emphasize the role of cultural heritage in architecture. This will build pride in traditional styles and create a demand for culturally embedded solutions. Internationalization: work with internationally minded and culturally appropriate design organizations and firms that have a proven history of sustainable design practice. Exchange programs can foster new ideas as well as reinforce local consciousness.

Conclusion

Rwandan urban architecture stands at a crossroads: globalized homogeneity or culturally rooted innovation. Evidence shows that integrating traditional, for example, inzu-inspired circular designs with sustainable materials like clay bricks can reduce emissions by 60% while fostering identity²¹. To achieve this, Rwanda

¹⁹ GGGI. Building Green in Rwanda – The journey so far — Global Green Growth Institute.

Available at: <https://surli.cc/tsxrpc> (accessed on December 26, 2023).

²⁰ P. Rubingisa, Kigali Master Plan (Report). Available at: <https://surl.it/gybpr> (accessed on October 24, 2023).

²¹ GGGI. Building Green in Rwanda – The journey so far — Global Green Growth Institute.

must scale participatory models like the Nyamirambo Women's Center, enforce green cultural policies with penalties for non-compliance, and invest in artisan training to revive crafts like imigongo weaving. This blueprint could position Rwanda as a leader in African neo-vernacular architecture.

This paper has shown that the accelerating urbanism occurring in cities such as Kigali and Huye holds both threats and rewards. Although globalization tends to push towards standardized design, Rwanda has the opportunity to develop a distinctive architectural identity as a tribute to its rich cultural heritage. Through the implementation of sustainable and locally adapted mechanisms, Rwanda is potentially able to serve as an example for the other countries in Africa undergoing a similar transformation. The achievement of this task depends upon the work of policymakers, architects, craftspersons, and citizens. By planned action, it will still be possible to achieve a cohesive mix of modernity and tradition in Rwanda so that its urban spaces do not ironically miss out their national character.

Conflict of Interest

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